

Nalco Docket No. 7701
Customer Number: 49459

REMARKS

Claims 1 to 21 are pending in this Application. The Office Action rejected Claims 1 to 21 under 35 U.S.C. § 103(a). Applicants have amended Claims 1, 18, and 20. Claim 11 has been cancelled and its elements have been incorporated into Claim 1. These amendments do not add new matter.

The Office Action rejected Claims 1 to 21 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,762,832 B2 to Fisher et al. ("Fisher") in view of U.S. Patent No. 5,278,074 to Rao et al. ("Rao") and U.S. Patent No. 5,922,606 to Jenkins et al. ("Jenkins").

In support of this rejection, the Office Action states:

Fisher et al., teaches the inclusion of a corrosion inhibitor, particularly an aromatic triazole such as benzotriazole and tolytriazole, in aqueous systems including treatment baths for copper – containing semiconductors or circuits. The concentration of corrosion inhibitor present is monitored by a UV spectroscopic system and feedback control is actuated base on the monitored concentration. Flow-through sample cells are provided at a plurality of locations in the aqueous system with pump and valve means being provided for the controlled introduction of fluids and corrosion inhibiting solutions based on the monitored concentrations. Sampling from the system can be performed continuously. Precise control of the desired concentration of the corrosion inhibitor is achieved with the monitoring and feedback control disclosed.

Rao et al., teach substituting a fluorometric monitoring system for spectroscopic systems used to monitor corrosion inhibitor concentrations in copper-containing aqueous systems, those inhibitors preferably including aromatic azoles such as benzotriazole and tolytriazole. Rao et al., teach that azoles are inherently fluorescent and that a fluorescent monitoring system is more accurate and more effective than a spectroscopic system whose radiation acts to degrade the corrosion inhibiting composition, and thus provides more accurately controlled dosing of the inhibitor. Monitoring with the fluorescent system can occur either intermittently or continuously.

Rao et al., further teach the provision of a sidestream from the aqueous system being monitored and pump and valve means to actuate the responsive dosage control. See column 1, lines 11-51, column 5, line 55 through column 6, line 21 and column 11, lines 10-30.

Jenkins et al., teach the well-recognized dependence of fluorescence on both temperature and pH in system providing chemical analysis based on fluorescence. See column 4, lines 1-10.

Nalco Docket No. 7701
Customer Number: 49459

It would have been obvious to one of ordinary skill in the art to substitute the fluorescent measurement/monitoring taught by Rao et al., for the spectroscopic monitoring in the corrosion control system of Fisher et al. and to apply the monitoring system to corrosion control in any aqueous fluid, including ultrapure, because the fluorescent system does not degrade the preferred corrosion inhibitors, and in fact, utilizes their inherent characteristics for more accurate concentration readings. It would further have been obvious to provide means to compensate for measured temperature and pH in the system to optimize the accuracy of the fluorescence measurement, in view of the known and expected dependence of fluorescence on both temperature and pH.

With respect to claims 4-6, both references teach application and monitoring of the inhibitor having concentration within the instantly claimed ranges. See column 11, lines 54-56 of Rao et al., and column 7, lines 50-55 of Fisher et al.

Office Action at pages 2 to 4.

Applicants respectfully disagree with and traverse this rejection for at least the reasons described below. Claims 1, 18, and 20 have been amended to further prosecution of this Application. The limitation of Claim 11 has been incorporated into Claim 1 and has been cancelled.

As noted in the Office Action, Fisher discloses, "The composition stream can be continuously analyzed for an extended period of time, typically for several days." (col. 5, lines 65 to 66). And Rao discloses, "The fluorescence monitoring is conducted on a continuous basis." (col. 2, lines 40 to 41). Applicants respectfully point out, however, that both Fisher and Rao are based on a sample-by-sample analysis.

Fisher states, "A sample of the composition is first introduced into the sample region of the measurement cell and the concentration is measured. If the measured concentration is within the control limits, another sample can be introduced into the measurement cell if further monitoring is desired." (col. 6, lines 31 to 42). Rao states, "A sample of the water is taken from an aqueous system, and optionally its pH is adjusted. The fluorescence intensity of the sample at the desired emission wavelength is measured. The measured fluorescence intensity is then compared to a working curve drawn up using standards in the concentration range of interest and this comparison provides a precise determination of the concentration of the corrosion inhibitor in the water sample drawn from the system." (col. 5., lines 7 to 23).

Nalco Docket No. 7701
Customer Number: 49459

In contrast, Amended Claim 1 (and Claims 2 to 10 and 12 to 17 through dependency) requires "fluorometrically monitoring in a flowcell the concentration of aromatic triazole corrosion inhibitors in the aqueous fluid, wherein the aqueous fluid is continuously circulated through the flowcell." Neither Fisher nor Rao disclose, teach, or suggest such continuous circulation through a flowcell. Both of these references disclose that measurements must be taken on a sample-by-sample basis and in no way teach or suggest that fluorescence of an aqueous fluid may be monitored in a flowcell where the aqueous fluid continuously circulates through the flowcell.

The continuous measurements disclosed in Fisher and Rao do not take place in a flowcell where the aqueous fluid is continuously circulated through the flowcell. Amended Claim 1 requires the continuous flow of the aqueous liquid through the flowcell. Thus, fluorescence measurements do not take place on a sample from the aqueous fluid. Rather, the fluorescence measurements occur on an aqueous fluid continuously circulating through the flowcell.

Therefore, Applicants respectfully assert that Amended Claim 1 (and Claims 2 to 10 and 12 to 17 by dependency) is patentably distinct and nonobvious over the above-described references. Accordingly, Applicants respectfully request that this rejection be withdrawn.

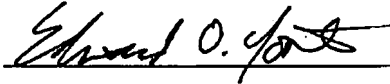
Likewise, Amended Claim 18 (and Claim 19 by dependency) and Amended Claim 20 (and Claim 21 by dependency) require continuous circulation as Amended Claim 1 above and thus are also patentably distinct and nonobvious over the described references for at least the reasons discussed above. Applicants respectfully request that this rejection also be accordingly withdrawn.

Nalco Docket No. 7701
Customer Number: 49459

CONCLUSION

In view of the foregoing amendments and remarks, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 103(a) and respectfully assert that pending Claims 1 to 10 and 12 to 21 of this Application are in condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully Submitted,



Edward O. Yonter, Reg. No. 54,882
Nalco Company
Patent and Licensing Department
1601 West Diehl Road
Naperville, IL 60563-1198
Phone: (630) 305-1783

Date: September 4, 2007